Testimony on H.R. 3890

A Bill to Reauthorize the Steel and Aluminum Energy Conservation and Technology Competitiveness Act of 1988

By

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Good morning, my name is Ronald J. Sutherland. I am a Ph. D economist, and have spent most of my career assessing energy policy issues. From 1980 through 1988, I worked at the Los Alamos National Laboratory. From 1988 through 1997, I was employed by Argonne National Laboratory, but was located at the Department of Energy's Forrestal building here in Washington DC, where I supported the DOE Policy Office and the Energy Information Administration. At present, I am an independent consulting economist where I continue to work on energy policy issues. My testimony reflects my own views. I am not associated with an organization that has an interest in this legislation.

The history of the DOE industrial technology program is one of limited success, and probably produces net costs to taxpayers. These net costs result from three program characteristics:

1. the DOE policy objective is to enhance energy efficiency;
2. the program justification is based on market barriers; and
3. the DOE program is not accountable in terms of providing benefits to taxpayers.

The DOE focus on energy efficiency does not make business sense; it contributes neither to the productivity of the business, nor to value to customers. Instead, businesses become more competitive by reducing average costs and increasing overall productivity, and particularly by increasing the productivity of labor and capital.

Energy efficiency is an inappropriate policy goal from the perspective of taxpayers. Indeed, the single most important point that Congress should recognize in forming energy policy is: "Energy efficiency and the efficient use of energy resources are different and unrelated concepts".[1] Programs and policies that contribute to energy efficiency may or may not improve the efficient use of energy resources. Policies that contribute to the efficiency of using energy resources may or may not increase energy efficiency. Taxpayers benefit from using energy and all other resources more efficiently; taxpayers do not necessarily benefit from increased energy efficiency. The flawed conceptual DOE model results in subsidizing technology development that does not improve the productivity of the industrial sector, and does not produce net benefits to taxpayers.

The DOE justifies its interference in private markets in terms of "market barriers." However, the adoption of all new technologies, products and processes is impeded by market barriers. Such barriers are merely benign characteristics of well functioning markets. A necessary condition for a beneficial government program is a market failure, and there is no expectation that DOE programs reduce market failures.[2]

The DOE is not, and perhaps cannot, be held accountable for its technology development investments. In contrast, private research institutes, such as the Gas Technology Institute, are highly accountable to sponsors, whose participation is voluntary. Consequently, the flawed policy model practiced by the DOE continues indefinitely, and DOE technology investments fail to have long term commercial success.

In a recent litigation case, I attempted to find an example of a new technology that penetrated the market quickly and obtained a substantial market share. In my search, I reviewed the OIT publication, "Office of Industrial Technologies: Summary of Program Results" which summarizes the results of more than "100 commercially successful technologies".[3] I found no examples of a technology success for my purposes. Instead, my overall reaction to the DOE 100 technology successes is that when the subsidy continues, technology development continues, when the subsidy stops, technology development and deployment also stop. In reviewing this document again, I find some technologies that appear to achieve market success, but the rate of success is very low considering the DOE claim of reflecting its 100 most successful technologies.

In pursuing some DOE technologies that looked promising, I contacted an engineer in a private firm that was participating in a DOE program. The engineer stated that DOE's fixation on energy efficiency is inconsistent with the business objective of increasing overall productivity and reducing average cost. Consequently, the DOE objective of increasing energy efficiency reduces the probability of a commercial success. The technology that I eventually found to support the litigation case was developed by the Gas Technology Institute. GTI focuses on developing technologies that will be a commercial success, because this success is critical to retaining funding.

While at Argonne National Laboratory I undertook a study of six large and energy intensive industries in the U.S. The report is known as the Argonne six industry study.[4] The study was based on the first-hand expertise of industry experts. The six industries include the iron and steel industry as well as the aluminum industry. Although the purpose of that study was to provide information about the impact of the Kyoto Protocol, some results are important for current legislation. General findings about the six energy intensive industries are as follows:[5]

- the U.S. industries are losing competitiveness in world markets;
- U.S. plants are maintaining competitiveness in domestic markets;
- Domestic employment is declining continuously over time;
- labor productivity is continuously increasing;
- no new "greenfield" plants will likely be constructed; and
- increased productivity results from capital investments in existing plants.

The Argonne study notes that the domestic steel industry has experienced a significant reduction in energy intensity since the 1980s. The industry capital investments have reduced "yield losses", which in turn improve capital, labor and energy productivity. Improved productivity and cost reduction was the industry objective; energy efficiency was merely a by-product.

The last two findings are crucial to the legislation currently being considered. If a successful commercialization of a DOE sponsored technology requires a new plant, this plant is likely to be constructed in a foreign country. In this case, U.S. taxpayers would directly subsidize, and contribute to, job losses in the United States. The proposed legislation should be carefully crafted so as not to contribute to domestic job losses.

The taxpayers in the U.S. would probably obtain the greatest benefit if federal funding for energy conservation R&D programs were simply terminated.[6] However, if Congress continues with these programs, I offer the following suggestions:

1. Taxpayers should be assured that most of the economic benefits from these DOE programs accrue in the U.S. These benefits must be in the form of improved productivity, reduced costs, or reduced emissions of plants located in the U.S. Such plants provide jobs to American labor and contribute to the domestic economy. The proposed legislation uses the term "domestic companies". This term is not sufficient to ensure that most of the benefit accrues within the U.S.

The proposed legislation states that a purpose of the statute is "…to develop advanced technologies…" My concern is that advanced technologies and processes are most feasible in new "greenfield" plants. As the Argonne study concludes, productivity in energy intensive U.S. industries is increased by retrofitting existing plants, not by constructing new plants in the U.S. The proposed legislation should be crafted more carefully to ensure that technology successes improve the productivity of existing domestic plants. The OIT report provides no recognition of the need to focus on retrofitting technologies, nor to focus on technologies that provide domestic benefits.

2. The DOE policy goals should be specified so as to produce benefits to taxpayers resulting from long term market success. The OIT report that describes 100 technology successes boasts of the amount of energy saved by its various efforts. Merely reducing Btu provides no benefit to taxpayers, or to the industrial sector. The rationale for taxpayer support for these DOE investments is that taxpayers share in the initial invest costs, but obtain benefits by long term commercial success and long term environmental improvement. As indicated in the OIT report, the DOE does not adequately specify the long term business objective of improving overall productivity, reducing production costs, or increasing market share.

3. The net benefits to taxpayers from these DOE investments could increase if the DOE program were subject to a higher level of accountability. I suggest that proposed legislation be revised to require the DOE to obtain an independent analysis of the economic benefits of its investments. The outside review must be conducted by independent experts, and not by national labs or other financial beneficiaries of the DOE program. Further, the review should be consistent with basic economic principles of cost benefit analysis. The independent analysis would include suggestions for improving the DOE investment process.

This concludes my prepared statement. Thank you.

References:

[1] Ronald J. Sutherland, "Energy Efficiency or the Efficient Use of Energy Resources," *Energy Sources*, Vol. 16, 1994, pp. 257-268.

[2] Ronald J. Sutherland, "Market Barriers To Energy-Efficiency Investments," *The Energy Journal*, Vol. 12, No, 3, July 1991, pp. 15-34.

[3] Office of Energy Efficiency and Renewable Energy, *Office of Industrial Technologies: Summary of Program Results*, U.S. Department of Energy, Washington DC, DOE/EE-0184.

[4] Ronald J. Sutherland, "The Impact of Potential Climate Change Commitments on Six Industries in the United States," *Energy Policy*, Vol. 26, No. 10, 1998, pp. 765-776.

[5] Ronald J. Sutherland, Nolan Richards, Michael Nisbet, Dan Steinmeyer, Ronald Slinn, Martin Tallett and Richard Fruehan, *The Impact of High Energy Price Scenarios on Energy-Intensive Sectors: Perspectives from Industry Workshops*, Argonne National Laboratory, Washington, DC, July 1997.

[6] Ronald J. Sutherland and Jerry Taylor, "Time to Overhaul Federal Energy R&D" *Policy Analysis*, The Cato Institute, No. 424, February 7, 2002.